

REMARKS

This is an amendment under 37 CFR §1.116. The remarks herein, to the extent they were not presented earlier, are now presented because they are necessitated by the arguments made by the Examiner in the last office action. Since this amendment is being filed within two months of the mailing date of the final rejection, the courtesy of an advisory action is respectfully requested.

Claims 1-15 and 25-27 are in this application. Claims 16-24 have been cancelled. Claims 8 and 15 have been amended. Claims 25-27 have been added. It is submitted that the amendments do not raise new issues and do not require any further searching as these amendments change "insulating layer" to "isolation layer" to improve clarity. It is further submitted that the new claims do not raise new issues and do not require any further searching as these claims are dependent claims.

Applicant requests that the Examiner initial and return a copy of the 1449 Form filed on February 10, 2004, and received by the PTO on February 13, 2004.

The Examiner objected to claims 2, 7, 9, and 14 because the "top surface of the fourth region" lacks a clear antecedent basis. Applicant believes that the claims have the necessary clarity required by MPEP §2173.05. However, in an effort to further prosecution, applicant amended claims 2 and 9 in the October 23, 2005 amendment. Claims 2 and 9 were also amended in the October 23, 2005 amendment to correct inadvertent typographical errors. Claims 7 and 14, in turn, depend indirectly from claims 2 and 9, respectively. The Examiner also objected to claims 21 and 23 which, as noted above, have been cancelled.

The Examiner rejected claims 1-15 and 21-24 under 35 U.S.C. §102(e) as being anticipated by Yamauchi et al. (U.S. Patent No. 6,836,001 B2). As noted

above, claims 21 and 23 have been cancelled. For the reasons set forth below, applicant respectfully traverses this rejection as applied to claims 1-15 and 25-27.

Claim 1 recites:

“a first region of a first conductivity type;
“a second region of a second conductivity type that lies over the first region;
“a third region of the first conductivity type that contacts the second region, the third region being spaced apart from the first region; and
“a fourth region of the second conductivity type that contacts the third region, the fourth region being spaced apart from the second region.”

In rejecting the claims, the Examiner pointed to n+ substrate 1 shown in FIG. 2 of Yamauchi as constituting the first region required by claim 1, and p- region 3 shown in FIG. 2 of Yamauchi as constituting the second region required by claim 1. In addition, the Examiner pointed to n-type region 4 shown in FIG. 2 of Yamauchi as constituting the third region required by claim 1, and n+ region 5 shown in FIG. 2 of Yamauchi as constituting the fourth region required by claim 1.

Applicant notes that claim 1 requires that the first and third regions must have the first conductivity type, and the second and fourth regions must have the second conductivity type. As a result, the structure shown in FIG. 2 of Yamauchi can not be read onto the limitations of claim 1. If p- region 3 shown in FIG. 2 of Yamauchi is read to be the second region required by claim 1, then n+ region 5 can not be read to be the fourth region required by claim 1 because p- region 3 and n+ region 5 do not have the same conductivity type.

The Examiner also pointed to FIG. 15 of the Yamauchi reference as teaching all of the limitations of claim 1, but did not identify any structure in FIG. 15 which can be read to be the first, second, third, and fourth regions required by claim 1. However, from what can be determined, none of the regions shown in FIG. 15 can be read to satisfy the requirements of claim 1.

For example, if n+ region 46 shown in FIG. 15 is read to be the fourth region required by claim 1, p-type region 44 is read to be the third region, and n- region 45 is read to be the second region, then there is no region which can be read to be the first region required by claim 1. P-type region 43 can not be read to be the first region because claim 1 requires that the first and third regions be spaced apart. As shown in FIG. 15 of Yamauchi, p-type region 43 is not spaced apart from p-type region 44, but instead contacts p-type region 44.

Thus, since FIG. 2 of the Yamauchi reference does not teach a region which can be read to be the fourth region, and FIG. 15 of Yamauchi does not teach a region which can be read to be the first region, claim 1 is not anticipated by the Yamauchi reference. In addition, since claims 2-15 and 25-27 depend either directly or indirectly from claim 1, claims 2-15 and 25-27 are not anticipated by the Yamauchi reference for the same reasons as claim 1.

With respect to claim 2, applicant notes that the Examiner did not point to any structure in FIG. 2 of the Yamauchi reference as constituting the trench required by claim 2. Instead, the Examiner pointed to trenches 50 and 53 shown in FIG. 15 of Yamauchi as constituting the trench required by claim 2. As noted above, however, claim 1, and thereby claim 2, can not be read onto the structure shown in FIG. 15 of Yamauchi because there is no region which can be read to be the first region required by the claims.

With respect to claim 8, the Examiner pointed to FIG. 2 of Yamauchi as teaching an insulating layer, but did not identify the structure the Examiner read to be the insulating layer. With respect to new claim 25, applicant can find nothing in FIG. 2 of Yamauchi that teaches or suggests an isolation layer that lies between n+ region 1 and p-type region 3 (read to be the first and second regions), and is spaced apart from the layer of insulation material.

With respect to claim 15, the Examiner pointed to FIGS. 11 and 13 of Yamauchi as teaching an insulating layer, but did not identify the structure the Examiner read to be the insulating layer. However, from what applicant can determine, FIGS. 11 and 13 of Yamauchi do not show any insulating layer that contacts n+ region 1 (read to be the first region). In these two figures, gate insulating film 7 does not contact n+ region 1. With respect to new claim 26, applicant can find nothing in FIG. 2 of Yamauchi that teaches or suggests an isolation layer that lies between n+ region 1 and p-type region 3 (read to be the first and second regions), and is spaced apart from the layer of insulation material.

With respect to claims 5 and 6, and new claim 27, applicant can find nothing in Yamauchi that teaches or suggests these limitations. In rejecting claims 5 and 6, the Examiner pointed to trench 6 shown in FIG. 2 of Yamauchi as constituting a plug. Trench 6, however, is not a plug as required by claim 5 and defined by applicant's specification, is not conductive as required by claims 6 and 27, and does not lie below two or more trenches as required by claim 27.

Thus, for the foregoing reasons, it is submitted that the application is in a condition for allowance. Therefore, the Examiner's early re-examination and reconsideration are respectively requested.

Respectfully submitted,

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